units of physical reality. All we can know is what we measure in the laboratory. We can take these measurements and we can operate on them mathematically. We can, in short, give certain quantitative values to these measurements. We can then operate on them according to mathematical tools which will be used now to grind out predictions of other measurements. And then, we go back to the laboratory and we find that the measurement actually works. If it does not, use another mathematical tool. It is just like sitting there with a whole box full of wrenches; if the one wrench does not fit, put it down, use another one until you find the right one. Let us put you in the dark so as to add a little mystery to it."

But this is precisely what you do. You have the entity; you have the tools, and you want to match, now, entity and tool to be able to do something with it. Notice the consequences of this system, if you unite fact and theory in the sense that the facts are what you measure, the theory here is a mathematical equation. The role of mathematics is, of course, central, for reality now is the equation itself. Ask a theoretical physicist, "What is the wave in asserting that wave equation," and he will tell you it is a mathematical fiction, but a physical reality. Because, the wave does not exist in real space, it exists in phase space, and unfortunately we do not. Here the physical reality is not out there but in the equation itself. Therefore the mathematics, now, are the highest point that one can reach.

This is an aristocratic science, for not everyone can learn the mathematics. This is a restricted science, restricted to those people who can, in fact, do the mathematics and do them well enough to use the tool as Heisenberg suggested in this kind of dialogue between experimentally measured facts and mathematical instruments. It too is a dogmatic science, for where, again, can you argue except to say, "You idiot, you are using a monkey wrench when what you really want is a crescent wrench." But once you point out that the guy has the wrong operator, or something similar, where, again, are you going to argue? The facts are there; the frequency is such and such; the mathematics are there. And if you use the tool properly you will get the right answer.

And notice the process, now; tools become the center of your whole endeavor. You want to build an instrument that will really measure frequency, not just to 3 places, or 4, let us have it for 12, and therefore a $30 million grant for building this. You also